SAMUELS AND NORTHROP CO., LPA
ATTORNEYS AT LAW

180 EAST BROAD STREET, SUITE 816
COLUMBUS, OHIO 43215

TELEPHONE 614 464-3232
TELECOPIER 614 464-0709

EMAIL: INFO@SN LAW COM

<u>DELIVERY VIA FAX AND REGULAR MAIL</u>

<u>CONFIDENTIAL AND INADMISSIBLE SETTLEMENT COMMUNICATION</u>

December 22, 2000

Craig Melodia
Assistant Regional Counsel
Region 5, USEPA
C-14J
77 West Jackson Blvd.
Chicago, Ill. 60604-3590

Re: Skinner Landfill---Aeronca Inc.

Dear Craig:

In accordance with your letter of November 8, 2000, I have enclosed portions of the Allocator's preliminary and final reports that pertain to Aeronca, Inc. These materials are being submitted only for purposes of settlement discussions with your agency, and Aeronca's waiver of confidentiality of the documents is limited to that purpose. Accordingly, none of the materials may be introduced into evidence.

The following materials are enclosed:

<u>Preliminary Allocation Report and Recommendations</u>, October 6, 1998: Appendix 1, Pages 7 and 8; Appendix 3, "Waste-in List for the Preliminary Allocation Report and Recommendations", Page 1 of 12 (redacted); Appendix 5, "Waste-in List in Liquid Waste Volume Order", Page 1 of 2 (redacted).

<u>Final Allocation Report and Recommendations</u>, April 12, 1999: Pages 29 and 30 (redacted); Appendix 1, pages 5 and 6 (redacted); Appendix 3, "Waste-in List for the Final Allocation Report and Recommendation", Page 1 of 12 (redacted); Appendix 5A, "Final Allocation Recommendations in Alphabetical Order", Page 1 of 3 (redacted).

I have also enclosed a report by Woodward-Clyde Consultants dated September 1, 1992, assessing the effect of Aeronca's potassium permanganate on conditions in the landfill. The report concluded that the spent potassium permanganate may have retarded the leaching of manganese from soil to ground water by counteracting reducing conditions that increase the solubility of naturally occurring manganese minerals in the soil. The report also concluded that manganese contributed little to the hazard posed by the landfill. The Allocator refused to consider this report in allocating a share to Aeronca. He also refused to consider Aeronca's cooperation with the government by participating in the interim remedial measures. Rather, his allocation is based solely on waste-in volume, which is only one of several "Gore factors" that must be considered in a proper allocation, Centerior Service Co. v. Acme Scrap Iron & Metal Corp., 153 F.3d 344 (6th Cir., 1998); United States v. R. W. Meyer, Inc., 932 F.2d 568 (6th Cir., 1991).

Please contact me after your review of the enclosed.

Yours truly,

Dave Northrop

David E. Northrop

Cc: John Furbay (w/encl.)

Skinner Landfill Superfund Site

Preliminary Allocation Report and Recommendations

John M. Barkett
Allocator

October 6, 1998

AERONCA, INC.

Aeronca is a manufacturer of metal aircraft engine components. In the mid 1960s, Aeronca made exhaust nozzles, plugs, pylons and other detail parts. The parts consisted of shaped metal pieces welded together. A potassium permanganate solution was used to help remove oxides and weld scale from the parts. The company has operated a facility at 1712 Germantown Road, Middletown, OH since 1940. This is the only facility operated by the company within 75 miles of the Site.

Type of Waste. Aeronca acknowledged sending waste to the site. The waste consisted of a liquid used in a dip tank as a cleaning solution for metals. The cleaning agent in the solution was potassium permanganate. No laboratory analyses exist of the cleaning solution in use at the time in question, which the company states is "through 1965." Aeronca claimed that "potassium permanganate is a strong oxidizer that is soluble in water. It will readily decompose in the presence of alcohols, many organic solvents, strong acids, and organic material, yielding potassium, oxygen, and manganese in a lower oxidation state, all of which are non-hazardous substances."

The company asserted that, at the time of disposal, "most of the potassium permanganate would have reacted to form non-oxidizing compounds." Aeronca further argued that while potassium permanganate appears on the CERCLA list of hazardous substances because its oxidizing properties are potentially harmful to the environment, spent, reacted potassium permanganate no longer has those properties and should not be considered hazardous.

Aeronca submitted the joint opinion of William J. Deutsch, Manager, Waste Engineering Services and Phyllis A. Brunner, Vice-President, Woodward-Clyde Consultants to support its position that there are other sources of manganese and that manganese is "not a very significant contributor to the calculated future risk of the site."

Waste-in Amount. Aeronca stated that it has no records to indicate the amount of solution it generated and it cannot provide a reliable estimate of volume. It references a letter dated November 16, 1964 from the county health department granting permission for Skinner to accept 7,800 gallons of waste potassium permanganate from Aeronca. (The company points out that it is not known if this waste was ever actually sent to Skinner.) Aeronca explained that the maximum capacity of the dip tank was 8,451 gallons. It assumed that this would equal one tankful. The Skinner log shows a payment by Aeronca of $360 in 1965, which may be related to this "one tankful."

The Skinner log also showed payments by Aeronca to Skinner in the years 1956 ($21.00) and 1963 ($45.00) beyond the $360 payment in 1965. The company's original response to the ADR Questionnaire indicated that a retiree, Mr. Kahney, recalled a few shipments to Skinner of spent potassium permanganate in the mid 1960s. He did not know the number of shipments or the volume. In its responses to the follow-up questions, Aeronca stated that it undertook an additional investigation and has clarified that its retired purchasing agent who it had reported as confirming a few shipments of potassium permanganate to Skinner, now claimed that he did not know the disposal site for this material. In addition, Aeronca had stated in its original response that the waste was disposed of in 55-gallon barrels. However, in the later response, the company claimed that interviewees said it was taken by tanker truck. In its position paper, Aeronca argued that there is no evidence of the nature and content of the waste reflected by these earlier log entries.

Aeronca does not address the correspondence in the nexus package. There is a July 7, 1964 letter to Aeronca from the Butler County Health Department stating that residents had reported that Aeronca had been disposing of industrial waste at "Skinner's dump." The letter cites to regulations that prohibit disposal of industrial waste in Butler County without "direct permission of the Board of Health." From other correspondence, it would appear that the regulations went into effect sometime in 1964 or late 1963.

There is a note at the bottom of the letter that reads:

> 7-31-64 Phone conversation - L.J. Kahney -- agreed (to tell) us of contents of disposal before any further disposal takes place -- last dumping Oct. 1963.

October 1963 happens to be a Skinner log entry date for Aeronca.

Mr. Len Kahney was interviewed as part of the questionnaire process. I assume this is the same person referred to in the note. There is no indication that he was shown this document or the note or asked about the contact. Rather the indication in a supplemental questionnaire response -- as noted above -- was that he did not know where the material shipped from the facility was taken.

I believe that the district court would conclude that the waste was the same for each of the log entries except for one caveat. There are other documents in the file which explain that Aeronca's Mr. Kahney sought permission in late 1964 to dispose of 8,000 gallons of "Turco Nitrad." This material is a liquid acid additive designed for use primarily in Nitric Acid Pickling Bath for the removal of scale and surface oxides. The Board refused permission to discharge this material at the Skinner Landfill and so advised Aeronca and Albert Skinner. However, the fact that such a solution was generated for discharge prompts the question of what was discharged in October 1963 and 1956? And what did Mr. Kahney mean when he was reported to have said that he recalled a "few shipments" of permangate solution in the mid 1960s? Does a few shipments represent the 1963 and 1964 log entries? Or are there missing log entries?

I am going to assume that the prior entries represent permanganate solution and that they represent the universe of volume but Mr. Kahney would obviously be the focus of discovery should litigation discovery ever occur.

A charge of $360 for 7,800 gallons is $.046 per gallon. Applying this rate to the charges of $66 ($45 plus $21) produces an additional total of 1,435 gallons. Adding this amount to 7,800 gallons produces a waste-in amount for Aeronca of 9,235 gallons.

Waste-in List for the Preliminary Allocation Report and Recommendations, Skinner Landfill Superfund Site, October 6, 1998

PRP	Source	Amount or Capacity	Compaction or Multiplier or Divisor	Frequency or loads	Wk/Mo/Yr	Years 1 is the default	Solid Sub Total	Liquid Sub total	Solid Total Cys	Liquid Total Gals	Response Cost Dollar Credit	Solid Waste In Total 363690	Percentage
AERONCA INC										9235	$12,885.61	363690	0.0000%

Waste-in List in Liquid Waste Volume Order for the Preliminary Allocation Report and Recommendations, Skinner Landfill Superfund Site, October 6, 1998

Name Of Party	Solid Waste In Cys	Liquid Waste In Gallons	Solid Waste In Total Cys	Percentage	Liquid Waste In Total Gallons	Percentage
AERONCA INC	0	9235	363690	0.0000%	259308	3.5613%

Skinner Landfill Superfund Site

Final Allocation Report and Recommendations

John M. Barkett
Allocator

April 12, 1999

Aeronca's Comments. Aeronca requested that the Allocator develop and apply toxicity factors for liquid waste in making the allocation. Aeronca argued that the Allocator erred in not considering the relative toxicity of liquid waste disposed, and assigning allocation of shares to disposers of liquid waste based solely on the volume of waste. Aeronca claims that the Sixth Circuit case United States v. R.W. Meyer, Inc., 932 F.2d 568 (6th Cir. 1991) requires the district court to consider relative toxicity of waste in allocating response costs. Aeronca also cited United States v. Atlas Mineral & Chemical, Inc., 41 ERC 1417 (E.D. Pa. 1995), in which the court used "toxicity multipliers" to account for relative toxicity, and Centerior Service Co. v. Acme Scrap Iron & Metal Corp., 47 ERC 1285, 1294 (6th Cir. 1998), which held that toxicity multipliers and other "Gore Factors" should be used in allocating shares. Aeronca further argues that the First Case Management Order requires the Allocator to consider relative toxicity (¶ 13.b provides that "the Allocator shall consider whatever equitable allocation factors he deems appropriate, including but not limited to, the following criteria commonly referred to as the 'Gore Factors' [the third of which is relative toxicity]..."). Further, Aeronca argues that equating Aeronca's allegedly unstable, nontoxic oxidizer with waste which is "quite toxic and persistent" is "highly inequitable" and inconsistent with the case management order and Sixth Circuit precedent.

Aeronca also felt it was unfair to treat liquid waste sources differently from solid waste sources. It requested that response costs be allocated equally between disposers of solid waste and the disposers or liquid waste, or alternatively, "fully justify" their disparate treatment. Aeronca claims that the allocation of 20% of Site costs to disposers of liquid waste and 10% to disposers of solid waste is "highly unfair." Aeronca argues that the court in Atlas Minerals, supra assigned one-half of response costs to high-volume waste and one-half to high-toxicity waste, which approach would require an even split of response costs here between the solid and liquid waste disposers. Aeronca suggests that any other result requires a detailed explanation and reasoning.

AERONCA, INC.

In its comment brief dated February 3, 1999, Aeronca, Inc. ("Aeronca") requested that the Allocator consider and evaluate a purported causation defense to liability. Aeronca further requested, pursuant to the First Case Management Order, that the Allocator make a zero allocation to Aeronca if he finds that it is less likely than not that Aeronca will be found liable.

Aeronca argues that the First Case Management Order, ¶ 13.b requires the Allocator recommend a zero allocation for any party that is less likely to fall within at least one of the classes of parties liable under § 107(a) of CERCLA. Aeronca argued that under CERCLA case law, an arranger for disposal is not liable for response costs unless there is some causation between the types of hazardous substance disposed of by the arranger and the incurrence of response costs. Aeronca cites United States v. Township of Brighton, Michigan, 47 ERC 1161 (6th Cir. 1998) and United States v. Alcan Aluminum Corp., 990 F.2d 711 (2nd Cir. 1993) in support of its position. Aeronca's defense is based on the following reasoning: (1) potassium permanganate is the only hazardous substance attributed to Aeronca; (2) potassium permanganate has never been detected at the site; (3) potassium permanganate is highly unstable and would have broken down to substances that are not hazardous under CERCLA; and (4) the process of breaking down potassium permanganate would have the beneficial effect of making manganese less likely to leach into ground water. According to Aeronca, if the Allocator determines that they would likely prevail with this defense, Aeronca should be allocated a zero share of the costs.

All sources of waste that contain a hazardous substance at a landfill on the National Priorities List that is the subject of a response action have caused at least $1 of investigation costs. Hence, for Aeronca to say that the disposal of its waste did not cause the incurrence of any response costs is simply wrong. Beyond this fact, I acknowledge that complicated and expensive technical arguments can be made at a landfill site about the role played by one waste stream versus another waste stream from a causation perspective. But these are allocation, not liability arguments, in my judgment.

Aeronca also argues for the use of toxicity factors. Aeronca obviously feels that it will come out ahead of other parties in such an analysis. I address this issue in the main body of this Final Report.

PRP	Source	Amount or Capacity	Compaction or Multiplier or Divisor	Frequency or loads	Wk/Mo/Yr	Years 1 is the default	Solid Sub Total	Liquid Sub total	Solid Total Cys	Liquid Total Gals	Response Cost Dollar Credit	Solid Waste In Total 372906	Percentage
AERONCA INC										9235	$12,885.61	372906	0.0000%

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Final Allocation Recommendations in Alphabetical Order, Skinner Landfill Superfund Site, April 12, 1999

Name Of Party	Solid Waste In Cys	Liquid Waste In Gallons	Solid Waste In Total Cys 372906	Percentage	Liquid Waste In Total Gallons 262252	Percentage	Solid Waste	Liquid Waste	Owner/ Operator & Part of Chem-Dyne	Rest of Chem-Dyne	Total
AERONCA INC	0	9235	372906	0.0000%	262252	3.5213%	0.00%	0.70%			0.70427%

Appendix 5A (New)

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Woodward-Clyde Consultants

Engineering & sciences applied to the earth & its environment

SEP 3 1992

CONFIDENTIAL
ATTORNEY WORK-PRODUCT
COMMUNICATION

September 1, 1992
92C0094A

David E. Northrop
Samuels and Northrop Co. LPA
180 East Broad Street, Suite 816
Columbus, Ohio 43215

Subject: Manganese Occurrence in Soil and Water at the Skinner Landfill

Dear Dave:

I have completed my review of the Phase II Remedial Investigation Report (May 1991), Baseline Risk Assessment (June 1991), and the Feasibility Study (April 1992) for the Skinner Landfill. This letter report provides a summary of the reported occurrence of manganese in soil and water at the Skinner Landfill and contains a brief review of the geochemistry of manganese as it pertains to the mobility of this metal in the environment. This report concludes with an evaluation of the fate of potassium permanganate ($KMnO_4$) in the landfill and the potential for permanganate to be a source of manganese in the soil and groundwater.

Introduction

At an industrial facility operated by Aeronca in Middletown, Ohio, a solution containing potassium permanganate as a cleaning agent was used in a cleaning bath. Spent solution was sent to the Skinner Landfill in West Chester, Ohio that has now become a CERCLA site. Woodward-Clyde Consultants has been retained to evaluate the fate of potassium permanganate in the landfill and the potential for the spent cleaning solution to be a source of manganese in the soil, groundwater or surface water in the vicinity of the landfill.

Occurrence of Manganese in Soil, Sediment and Water at the Skinner Landfill

The Remedial Investigation (RI) Report, Baseline Risk Assessment (BRA) and Feasibility Study (FS) of the Skinner Landfill prepared by WW Engineering & Science for EPA Region V were reviewed to evaluate the presence of manganese in the environmental media and determine if manganese has been considered by EPA to be a contaminant of concern in any of these media.

Sixty-two soil samples were collected in the vicinity of the buried waste lagoon and analyzed for a wide variety of potential contaminants, including manganese. The range of detected manganese concentrations in soil near the waste lagoon is 168 to 2,430 mg/kg (RI Table 5.3). Seven soil samples were collected in the vicinity of the buried pit and analyzed for manganese. The range of detected manganese concentrations in soil near the buried pit is 639 to 3,630 mg/kg (RI Table 5.4). Nineteen additional soil samples were collected and analyzed for manganese from monitoring well boreholes throughout the site. The range of detected manganese concentrations from these samples is 337 to 1,830 mg/kg (RI Table 5.5). The range of background concentrations for manganese in soil has been reported as 542 to 1,180 mg/Kg (RI Tables 5.3, 5.4 and 5.5). Manganese is not considered a chemical of concern for soils based on a comparison with background levels (BRA Table 2-1).

Sediments from three creeks, three ponds and three leachate seeps were sampled. The range of manganese concentrations for the 32 sediment samples collected is 470 to 3,520 mg/Kg (RI Tables 5.13, 5.15, 5.17 and 5.19). The range of background concentrations for manganese in sediment has been reported as 805 to 3,250 mg/Kg (RI Tables 5.13, 5.15, 5.17 and 5.19). Manganese is not considered a chemical of concern for sediments based on a comparison with background levels (BRA Table 2-1).

Manganese was detected in 13 of 15 water samples collected from the unconsolidated sediment wells. The range of manganese concentrations is 0.0346 to 1.93 mg/L (RI Table 5.8). The range of background manganese concentrations for the unconsolidated sediment wells is 0.021 to 0.074 mg/L (RI Table 5.8). Manganese was detected in 14 water samples collected from the bedrock wells. The range of manganese concentrations is 0.016 to 1.43 mg/L (RI Table 5.9). The background manganese concentration for the bedrock wells is reported as 0.0719 mg/L (RI Table 5.9). [The secondary Maximum Contaminant Level for manganese in drinking water is 0.05 mg/L.] Based on a comparison of measured manganese concentrations in groundwater with background concentrations, manganese is considered a chemical of concern in the bedrock and unconsolidated sediment groundwater (BRA Table 2-1).

Surface water from three creeks, three ponds and three leachate seeps was sampled and analyzed during Phase II of the RI. Based on a comparison with background manganese concentrations, manganese is not considered a chemical of concern in surface water at any of these locations except Skinner Creek (BRA Table 2-1). The range of manganese concentrations for the surface water samples collected from Skinner Creek is 0.0163 to 0.0715 mg/Kg (RI Tables 5.14). The background manganese concentration for water in Skinner Creek is reported as 0.0094 mg/Kg (RI Table 5.14).

In summary, manganese is not considered to be a chemical of concern in soils or sediments at the Skinner Landfill. Because it is elevated in concentration above background in bedrock and unconsolidated sediment groundwater and surface water in Skinner Creek, manganese is considered a chemical of concern for these media. The following section of this report discusses the geochemistry of manganese as it applies to the presence and mobility of manganese in the natural environment and under contaminant conditions.

Manganese Geochemistry

The geochemistry of manganese is complex because it occurs in three valence states Mn(II), Mn(III) and Mn(IV) under most natural environmental conditions. Potassium permanganate ($KMnO_4$) is an industrial product that is used as a strong oxidizing agent because manganese in permanganate is in the Mn(VII) valence state. Mn(VII) is unstable and, under appropriate conditions, will clean material by oxidation. In this reaction, manganese is reduced to a more stable, lower valence state. In solution under near neutral pH conditions, the dominant manganese species (Mn^{2+} and $MnOH^{+}$) are in the Mn(II) valence state.

As a consequence of the variety of valence states of manganese, the solubilities of manganese minerals are strongly affected by the oxidation/reduction (redox) state of the environment as well as the pH. For instance, in pure water under well oxidized conditions (pe = 9.62, where pe is the negative log of the activity of the electron) and a solution pH of 7, the solubilities, based on thermodynamic equilibrium calculations, of pyrolusite (ß-MnO_2) and manganite (γ-MnOOH), both common soil minerals, are equal to about 0.25 mg/L. This is a common dissolved manganese concentration found in oxidized groundwater. If the pe were lowered by 1 pe unit to 8.62 (i.e., less oxidizing conditions), the solubility of pyrolusite would be 25 mg/L and the solubility of manganite would be 2.5 mg/L. Concentrations of manganese in groundwater in areas of organic contamination associated with landfills or leaking storage tanks are commonly in the range of 10 to 30 mg/L (Baedecker, M. and M.A. Apgar. 1984. Hydrogeochemical Studies at a Landfill in Delaware. Studies in Geophysics pp. 127-138). The reason for the elevated manganese concentrations in the groundwater is that the organic contaminants consume dissolved oxygen in the groundwater and produce local conditions that are reducing. This condition increases the solubility of the naturally occurring manganese minerals in the soil. The upper limit on dissolved manganese concentration under reducing conditions may be controlled by the formation of rhodochrosite ($MnCO_3$) which forms when CO_2(g) pressures are high (Lindsay, W.L. 1979. Chemical Equilibria in Soils, Wiley-Interscience, 449p.). A condition of high

$CO_2(g)$ pressure is also associated with the oxidation of organic contaminants in soil or groundwater.

<u>Fate of Potassium Permanganate and Manganese at the Skinner Landfill</u>

In the early years of operation of the Skinner property as a landfill, it was used to dispose of general municipal refuse (EPA Proposed Plan for Skinner Landfill, April 1992). As discussed above, the leachate produced by refuse in landfills produces reducing conditions that generally mobilize manganese in the subsoil below the landfill. This results in elevated manganese concentrations in water compared to normal oxidizing conditions of near surface groundwater. Organic solvents subsequently added to the landfill as industrial waste would tend to maintain the reducing conditions and keep manganese mobile. On the other hand, permanganate in the spent wash solution, being a strongly oxidizing compound, would tend to produce oxidizing conditions. Under oxidizing conditions and pH values measured for the unconsolidated sediment and bedrock groundwater (6.67 to 9.51, RI Table 5.6), manganese minerals are not very soluble, as discussed above, and it is rare to find dissolved manganese concentrations greater than 1 mg/L under these conditions. Under oxidizing conditions, the manganese in the permanganate will precipitate in the soil because potassium permanganate is not thermodynamically stable. The precipitation of a manganese mineral will provide a source of manganese in the soil, however natural soil is also a source of manganese as shown by the background soil manganese concentrations reported as 542 to 1,180 mg/Kg (RI Table 5.3). The organic contaminants at the site mobilize the manganese by producing reducing conditions.

<u>Summary and Conclusions</u>

Manganese is considered a chemical of concern only for the groundwater and Skinner Creek surface water at the Skinner Landfill site. The disposal of spent potassium permanganate cleaning solution to the landfill adds manganese to the environment; however, the geochemistry of manganese is such that permanganate will produce oxidizing conditions and form relatively insoluble manganese minerals. If oxidizing conditions are maintained, the dissolved manganese concentrations in groundwater and surface water should not be elevated relative to background. The mechanism for mobilizing manganese at the Skinner Landfill is the reducing conditions created by the organic material in the waste disposal areas. Under reducing conditions, oxidized manganese minerals are soluble. Oxidized manganese minerals are common in soil and probably account for the measured manganese concentrations in background soil samples. The actual source of elevated dissolved manganese found in the groundwater and surface water downgradient of the landfill may be natural subsurface material below the landfill as well as the material in the landfill itself.

The calculated risk provided in the Baseline Risk Assessment should also be considered in order to give a perspective on the importance of manganese as a contaminant of concern. The potential threat to human health from a site is calculated in terms of carcinogenic and noncarcinogenic risk. EPA has determined that the carcinogenic risk to people currently living, working or recreating on the site is unacceptable. Manganese is not classified as a carcinogen (Group D), and therefore does not contribute to this carcinogenic risk. Noncarcinogenic risk is evaluated by calculating the hazard index of an exposure pathway such as drinking groundwater. The hazard index is the sum of the hazard quotients of individual contaminants. For groundwater, the contribution of manganese to the hazard index is small. As shown on Table 5-29 of the BRA, the manganese contribution to the hazard index from ingestion of groundwater is less than or close to 1%. The hazard index for ingestion of surface water from Skinner Creek is much less than one (BRA Table 5-33); therefore, this surface water does not pose a noncarcinogenic health risk.

As a consequence, not only is permanganate only one of the possible sources of manganese in the environment (and permanganate would tend to immobilize rather than mobilize manganese), but manganese is not a very significant contributor to the calculated future risk of the site. In addition, the mobilization of manganese is likely due to other sources of contamination (organic waste) at the site which are affecting the subsurface redox conditions.

Sincerely,

WOODWARD-CLYDE CONSULTANTS

William J. Deutsch
Manager, Waste Engineering Services

Phyllis A. Brunner
Vice President

(WP51DOCS\SAMNORTH\MANGANES.LTR)cm